What is claimed is:

1. A method for producing high purity colloidal silica comprising the steps of:

providing a quantity of potassium silicate;

subjecting said quantity of potassium silicate stream to an ion exchange process to remove a first portion of potassium therefrom to produce a quantity of colloidal silica; and

subjecting said quantity of colloidal silica to ultrafiltration to remove a portion of sodium therefrom, producing a quantity of high purity colloidal silica.

2. The method of Claim 1, wherein said quantity of potassium silicate has a sodium concentration of less than about 100 ppm.

3. The method of Claim 1, wherein said quantity of colloidal silica has a sodium concentration of less than about 10 ppm.

4. The method of Claim 1, wherein said quantity of high purity colloidal silica has a sodium concentration of less than about 1 ppm.

5. The method of Claim 1, wherein said quantity of colloidal silica consists essentially of silica particles having a size generally between 8 nanometers and 200 nanometers.

6. The method of Claim 1, wherein said ion exchange process step includes the step of contacting said quantity of potassium silicate with a cation exchange resin.

7. The method of Claim 6, wherein said cation exchange resin is selected from the group consisting of carboxylic resins, sulfonated natural materials, and sulfonated styrene-dibenzene copolymers.

8. The method of Claim 1, wherein said ultrafiltration step includes the steps of concentrating said colloidal silica and washing said colloidal silica with deionized water.

9. The method of Claim 8, wherein said ultrafiltration step further includes the step of adding potassium hydroxide to said concentrated colloidal silica to maintain a desired pH and cation concentration.

10. A system for producing high purity colloidal silica comprising:

an ion exchange reactor for receiving a quantity of potassium silicate and removing a portion of potassium therefrom to produce a quantity of colloidal silica; and

an ultrafiltration device for receiving said quantity of colloidal silica and removing a portion of sodium therefrom to produce a quantity of high purity colloidal silica.

11. The system of Claim 10, wherein said quantity of potassium silicate has a sodium concentration of less than about 200 ppm.

12. The system of claim 10, wherein said quantity of colloidal silica has a sodium concentration of less than 10 ppm.

13. The system of claim 10, wherein said quantity of high purity colloidal silica has a sodium concentration of less than 1 ppm.

14. The system of Claim 10, wherein said ion exchange reactor includes a cation exchange resin.

15. The system of Claim 14, wherein said cation exchange resin is selected from the group consisting of carboxylic resins, sulfonated natural materials, and sulfonated styrene-dibenzene copolymers.

16. The system of Claim 10, wherein said ultrafiltration device includes means for concentrating said colloidal silica and washing said colloidal silica with deionized water.

17. The system of Claim 16, wherein said ultrafiltration device further includes means for adding potassium hydroxide to said concentrated colloidal silica to maintain a desired pH and cation concentration.

18. A method for producing high purity colloidal silica and a high purity potassium salt, said method comprising the steps of:

providing a quantity of potassium silicate;

subjecting said quantity of potassium silicate to an ion exchange process to remove a first portion of potassium therefrom to produce a quantity of colloidal silica and a potassium enriched ion exchange resin;

subjecting said quantity of colloidal silica to ultrafiltration to remove a portion of sodium therefrom, producing a quantity of high purity colloidal silica;

regenerating said potassium rich ion exchange resin with an acid to produce a potassium salt stream; and

subjecting said potassium salt stream to evaporation and crystallization to remove a portion of sodium therefrom to produce a quantity of high purity potassium salt.

19. The method of Claim 18, wherein said quantity of colloidal silica has a sodium concentration of less than about 10 ppm.

20. The method of Claim 18, wherein said quantity of high purity colloidal silica has a sodium concentration of less than about 1 ppm.

21. The method of Claim 18, wherein said quantity of high purity potassium salt has a sodium concentration of less than about 10 ppm.

22. A method for producing a high purity potassium hydroxide, said method comprising the steps of

providing a quantity of potassium silicate;

subjecting said quantity of potassium silicate to an ion exchange process to remove a first portion of potassium therefrom to produce a quantity of colloidal silica and a quantity of potassium enriched ion exchange resin;

regenerating said quantity of potassium rich ion exchange resin with an acid to produce a quantity of potassium salt;

subjecting said quantity of potassium salt to evaporation and crystallization to remove a portion of sodium therefrom to produce a quantity of high purity potassium salt and

subjecting said quantity of high purity potassium salt to electrodialysis and/or electrolysis to produce a high purity stream of potassium hydroxide.

23. The method of Claim 22, wherein said quantity of high purity potassium hydroxide has a sodium concentration of less than about 100 ppm.

24. The method of Claim 22, wherein said quantity of high purity potassium hydroxide salt has a sodium concentration of less than about 10 ppm.

25. The method of Claim 22, further including the step of mixing a portion of said quantity of high purity colloidal silica with a portion of said quantity of high purity potassium hydroxide to produce a high purity CMP slurry.